

LISTING OF THE CLAIMS

1. (Currently amended) A ~~probe~~ background electrolyte solution for detecting ~~anions~~ ions in a sample using capillary electrophoresis ~~characterized in that the~~ comprising:

a probe that is comprised of at least one-or-more vinylogous carboxylic acid ~~compounds~~ compound in a concentration of about 2 to 5 mM, wherein the vinylogous carboxylic acid compound is not tropolone.

2. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one-or-more vinylogous carboxylic acid compounds ~~is comprised of~~ has a structure comprising: one or more enol functional groups in conjugation with one or more carbonyl functional groups through one or more carbon-carbon or ~~carbon-nitrogen~~ carbon-nitrogen double bonds.

3. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one-or-more vinylogous carboxylic acid compounds ~~include~~ is present as a keto-enol tautomers of said compounds tautomer.

4. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one-or-more vinylogous carboxylic acid compounds ~~include~~ is an aromatic compounds compound having a stabilized resonance ~~structures~~ structure that ~~are~~ is part of its vinylogous carboxylic acids acid function.

5. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one-or-more vinylogous carboxylic acid compounds ~~include~~ is a heteroatom analogues analog of a keto-enol ~~tautomers~~ tautomer.

6. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one-or-more vinylogous carboxylic acid compounds ~~include~~ is a heteroatom aromatic compounds compound having a stabilized resonance ~~structures~~ structure that ~~are~~ is part of its vinylogous carboxylic acids acid function.

7. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one ~~or more~~ vinylogous carboxylic acid compounds is ~~3,4-dihydroxy-3-cyclobutene-1,2-dione (squaric acid)~~ 3,4-dihydroxy-3-cyclobutene-1,2-dione.

8. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one ~~or more~~ vinylogous carboxylic acid compounds is ~~2,5-dihydroxy-1,4-benzoquinone~~ 2,5-dihydroxy-1,4-benzoquinone.

9. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one ~~or more~~ vinylogous carboxylic acid compounds is ~~4,5-dihydroxy-4-cyclopentene-1,2,3-trione (croconic acid)~~ 4,5-dihydroxy-4-cyclopentene-1,2,3-trione.

10. (Canceled).

11. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one ~~or more~~ vinylogous carboxylic acid compounds is ~~5,5-dimethyl-1,3-cyclohexane dione (dimedone)~~ 5,5-dimethyl-1,3-cyclohexanedione.

12. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one ~~or more~~ vinylogous carboxylic acid compounds is ~~6-hydroxy-1-tetralone~~ 6-hydroxy-1-tetralone.

13. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said at least one ~~or more~~ vinylogous carboxylic acid compounds are is selected from the group consisting of: 3,4-dihydroxy-3-cyclobutane-1,2-dione (squaric acid); 2,5-dihydroxy-1,4-benzoquinone, and 2,5-dihydroxy-1,4-benzoquinone; 4,5-dihydroxy-4-cyclopentene-1,2,3-trione (croconic acid) 4,5-dihydroxy-4-cyclopentene-1,2,3-trione; 2-hydroxy-2,4,6-cycloheptatrienone (tropolone); 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone (rhodizonic acid) 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone; 2-hydroxy-1,4-naphthoquinone 2-hydroxy-1,4-naphthoquinone; 3-oxo-1-gulofuranolactone 3-oxo-1-gulofuranolactone; 2,2-dimethyl-1,3-dioxane-4,6-dione 2,2-dimethyl-1,3-dioxane-4,6-dione; 4-ketobutyrolactam; 5,5-dimethyl-1,3-cyclohexane dione 5,5-dimethyl-1,3-cyclohexanedione; tetrahydrofuran-2,4-dione tetrahydrofuran-2,4-dione; 6-hydroxy-1-tetralone 6-hydroxy-1-tetralone; 2,3-dihydroxy-2-cyclopropene-1-one (deltic acid) 2,3-dihydroxy-2-cyclopropene-1-one; and uric acid.

14. (Currently amended) The ~~probe~~ background electrolyte solution of Claim [[13]] 1 wherein said ~~group of at least one~~ vinyllogous carboxylic acid compounds include substituted forms wherein the compound has a peripheral substituent that does not alter its vinyllogous carboxylic acid UV-chromophore is maintained.

15. (Currently amended) The ~~probe~~ background electrolyte solution of Claim 1 wherein said ions in said sample are anions and are selected from the group consisting of: bromide, carbonate, bicarbonate, chloride, fluoride, nitrate, nitrite, phosphate and sulfate and small molecular weight organic anions.

16. (Canceled)

17. (Currently amended) The ~~probe~~ background electrolyte solution of Claim [[10]] 1 wherein said ~~vinyllogous carboxylic acid compounds include positively charged~~ probe includes a cationic enol ester derivatives derivative of said a vinyllogous carboxylic acid compound.

18. (Currently amended) The ~~probe~~ background electrolyte solution of Claim [[10]] 1 wherein said ~~vinyllogous carboxylic acid compounds include positively charged~~ probe includes a cationic enol amide derivatives derivative of said a vinyllogous carboxylic acid compound.

19. (Currently amended) The ~~probe~~ background electrolyte solution of Claim [[10]] 1 wherein said ions in said sample are ~~eation~~ cations and are selected from the group consisting of: Na⁺, K⁺, Mg⁺², Ca⁺², and small molecular weight organic cations.

20. (Currently amended) A background electrolyte solution for ~~detecting indirect detection of~~ ions in a sample using capillary electrophoresis ~~by indirect detection~~, comprising:

at least one probe ~~comprised of one or more~~ that is a vinyllogous carboxylic acid ~~compounds~~ compound; and

a buffer electrolyte.

21. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds is comprised of~~ compound has a structure comprising: one or more enol functional groups in conjugation with one or

more carbonyl functional groups through one or more carbon-carbon or ~~carbon-nitrogen~~
carbon-nitrogen double bonds.

22. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is present as a keto-enol tautomers of said compounds tautomer.

23. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is an aromatic compounds compound having a stabilized resonance structures structure that are is part of its vinylogous carboxylic acids acid function.

24. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is a hetero-atom analogues analog of a keto-enol tautomers tautomer.

25. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is a heteroatom aromatic compounds compound having a stabilized resonance structures structure that are is part of its vinylogous carboxylic acids acid function.

26. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds compound~~ is 2,3-dihydroxy 3-cyclobutene 1,2-dione (squaric acid) 3,4-dihydroxy-3-cyclobutene-1,2-dione.

27. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds compound~~ is 2,5-dihydroxy 1,4-benzoquinone 2,5-dihydroxy-1,4-benzoquinone.

28. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds compound~~ is 4,5-dihydroxy 4-cyclopentene 1,2,3-trione (croconic acid) 4,5-dihydroxy-4-cyclopentene-1,2,3-trione.

29. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds compound~~ is 2-hydroxy 2,4,6-cycloheptatrienone (tropelone) 2-hydroxy-2,4,6-cycloheptatrienone.

30. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds~~ compound is ~~5,5-dimethyl-1,3-cyclohexane-dione (dimedone)~~ 5,5-dimethyl-1,3-cyclohexanedione.

31. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds~~ compound is ~~6-hydroxy-1-tetralone~~ 6-hydroxy-1-tetralone.

32. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds are~~ compound is selected from the group consisting of: ~~3,4-dihydroxy-3-cyclobutane-1,2-dione (squaric acid); 2,5-dihydroxy-1,4-benzoquinone, and 2,5-dihydroxy-1,4-benzoquinone; 4,5-dihydroxy-4-cyclopentene-1,2,3-trione (croconic acid) 4,5-dihydroxy-4-cyclopentene-1,2,3-trione; 2-hydroxy-2,4,6-cycloheptatrienone (tropolone) 2-hydroxy-2,4,6-cycloheptatrienone; 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone (rhodizonic acid) 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone; 2-hydroxy-1,4-naphthoquinone 2-hydroxy-1,4-naphthoquinone; 3-oxo-1-gulofuranolactone 3-oxo-1-gulofuranolactone; 2,2-dimethyl-1,3-dioxane-4,6-dione 2,2-dimethyl-1,3-dioxane-4,6-dione; 4-ketobutyrolactam; 5,5-dimethyl-1,3-cyclohexane-dione 5,5-dimethyl-1,3-cyclohexanedione; tetrahydrofuran-2,4-dione tetrahydrofuran-2,4-dione; 6-hydroxy-1-tetralone 6-hydroxy-1-tetralone; 2,3-dihydroxy-2-cyclopropene-1-one (deltic acid) 2,3-dihydroxy-2-cyclopropene-1-one; and uric acid.~~

33. (Currently amended) The background electrolyte solution of Claim 20 wherein said ~~group of~~ vinylogous carboxylic acid ~~compounds~~ compound ~~include substituted forms wherein the~~ has a peripheral substituent that does not alter its vinylogous carboxylic acid UV-chromophore ~~is maintained~~.

34. (Canceled)

35. (Currently amended) The ~~probe~~ background electrolyte solution of claims 1 or 20 wherein said ~~probe~~ background electrolyte solution is provided in a kit for use in a capillary electrophoresis system.

36. (Canceled)

37. (Canceled)

38. (Currently amended) The background electrolyte solution of Claim 20 wherein the ~~one or more~~ vinylogous carboxylic acid ~~compounds are~~ compound is present at a concentration in the range of about 2 to 5 mM.

39. (Currently amended) A method of indirectly detecting ions in a sample using a capillary electrophoresis ~~system having a capillary~~, comprising:

~~filling the capillary with a background electrolyte containing one or more probes comprised of one or more vinylogous carboxylic acid compounds;~~

introducing the a sample into the a capillary with a background electrolyte solution containing one or more probes wherein at least one of said probes is a vinylogous carboxylic acid compound, and a buffer;

applying an ~~electrical~~ electric field along the capillary to cause the ~~ion~~ ions in the sample to move and separate along the capillary to a detection region, region and to separate from each other along the capillary; and

detecting the ions indirectly by ultraviolet (UV) photometric detection.

40. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds is comprised of~~ compound has a structure comprising: one or more enol functional groups in conjugation with one or more carbonyl functional groups through one or more carbon-carbon or ~~carbon-nitrogen~~ carbon-nitrogen double bonds.

41. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is present as a keto-enol tautomers of said compounds tautomer.

42. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is an aromatic compounds compound having a stabilized resonance structures structure that are is part of its vinylogous carboxylic ~~acids~~ acid function.

43. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is a hetero-atom analogues analog of a keto-enol tautomers tautomer.

44. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds include~~ compound is a heteroatom aromatic compounds compound having a stabilized resonance ~~structures~~ structure that ~~are~~ is part of its vinyllogous carboxylic acids acid function.

45. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~2,3-dihydroxy-3-cyclobutene-1,2-dione (squaric acid)~~ 3,4-dihydroxy-3-cyclobutene-1,2-dione.

46. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~2,5-dihydroxy-1,4-benzoquinone~~ 2,5-dihydroxy-1,4-benzoquinone.

47. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~4,5-dihydroxy-4-cyclopentene-1,2,3-trione (croconic acid)~~ 4,5-dihydroxy-4-cyclopentene-1,2,3-trione.

48. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~2-hydroxy-2,4,6-cycloheptatrienone (tropelone)~~ 2-hydroxy-2,4,6-cycloheptatrienone.

49. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~5,5-dimethyl-1,3-cyclohexane-dione (dimedone)~~ 5,5-dimethyl-1,3-cyclohexanedione.

50. (Currently amended) The method of Claim 39 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~6-hydroxy-1-tetralone~~ 6-hydroxy-1-tetralone.

51. (Currently amended) The probe of Claim 39 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds are~~ compound is selected from the group consisting of: ~~3,4-dihydroxy-3-cyclobutane-1,2-dione (squaric acid); 2,5-dihydroxy-1,4-benzoquinone; and 2,5-dihydroxy-1,4-benzoquinone; 4,5-dihydroxy-4-cyclopentene-1,2,3-trione (croconic acid); 4,5-dihydroxy-4-cyclopentene-1,2,3-trione; 2-hydroxy-2,4,6-cycloheptatrienone (tropelone); 2-hydroxy-2,4,6-cycloheptatrienone; 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone (rhodizonic acid); 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone; 2-hydroxy-1,4-~~

~~naphthoquinone 2-hydroxy-1,4-naphthoquinone; 3-oxo-1-gulofuranolactone 3-oxo-1-gulofuranolactone; 2,2-dimethyl-1,3-dioxane-4,6-dione 2,2-dimethyl-1,3-dioxane-4,6-dione; 4-ketobutyrolactam; 5,5-dimethyl-1,3-cyclohexane-dione 5,5-dimethyl-1,3-cyclohexanedione; tetrahydrofuran-2,4-dione tetrahydrofuran-2,4-dione; 6-hydroxy-1-tetralone 6-hydroxy-1-tetralone; 2,3-dihydroxy-2-cyclopropene-1-one (deltic acid) 2,3-dihydroxy-2-cyclopropene-1-one;~~ and uric acid.

52. (Currently amended) The method of Claim 39 wherein said vinylogous carboxylic acid ~~compound compounds include positively charged~~ is a cationic enol ester derivatives derivative of said compound a vinylogous carboxylic acid.

53. (Currently amended) The ~~probe method~~ method of Claim 39 wherein said vinylogous carboxylic acid ~~compound compounds include positively charged~~ is a cationic enol amide derivatives derivative of said compound a vinylogous carboxylic acid.

54. (Currently amended) The method of Claim 39 ~~where~~ wherein said capillary has an interior that is treated to reverse cathodal electro osmotic flow.

55. (Currently amended) The method of Claim 39 ~~where~~ wherein said one or more probes are selected such that ions of differing molecular weight ~~may be detected~~ in said sample may be detected by each of said probes.

56. (Currently amended) The method of Claim 39 ~~where~~ wherein said ions are anions.

57. (Currently amended) The method of Claim 39 wherein said ions are ~~cation~~ cations, and ~~said one or more probes are comprised of positively charged cationic ester derivatives of said vinylogous carboxylic acid compounds or positively charged cationic amide derivatives of said vinylogous carboxylic acid compounds~~ are selected from the group consisting of: Na⁺, K⁺, Mg⁺², Ca⁺², and small molecular weight organic cations.

58. (Currently amended) The method of Claim 56 ~~where~~ wherein said capillary is an anodal capillary and anodal flow of said anions occurs within said capillary.

59. (Currently amended) The method of Claim 56 ~~where~~ wherein said background electrolyte solution includes an ~~EOF~~ electro-osmotic flow modifier and anodal flow of said anions occurs within said capillary, and wherein said one or more probes is of

sufficiently high molar ~~absorptions~~ absorptivity that its concentration is low enough to avoid precipitating the modifier within the capillary.

60. (Currently amended) A capillary electrophoresis apparatus for indirectly detecting ions in a sample, comprising: a capillary having a background electrolyte solution containing one or more probes ~~comprised of one or more~~ that is a vinylogous carboxylic acid ~~compounds~~ compound, and a buffer;

an electrical source ~~which applies~~ that is configured to apply an electrical electric field along the capillary to cause the ions to move and to separate from each other along the capillary to a detection region, and

a detector ~~which detects~~ that is configured to detect the ions by indirect ultraviolet (UV) photometric detection.

61. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds is comprised of~~ compound has a structure comprising: one or more enol functional groups in conjugation with one or more carbonyl functional groups through one or more carbon-carbon or ~~carbon-nitrogen~~ carbon-nitrogen double bonds.

62. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is present as a keto-enol tautomers ~~of said compounds~~ tautomer.

63. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is an aromatic compounds compound having a stabilized resonance ~~structures~~ structure that ~~are~~ is part of its vinylogous carboxylic ~~acids~~ acid function.

64. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is a hetero-atom analogues analog of a keto-enol ~~tautomers~~ tautomer.

65. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is a heteroatom aromatic

~~compounds~~ compound having a stabilized resonance ~~structures~~ structure that ~~are~~ is part of its vinyllogous carboxylic ~~acids~~ acid function.

66. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~2,3-dihydroxy-3-cyclobutene-1,2-dione~~ (squaric acid) 3,4-dihydroxy-3-cyclobutene-1,2-dione.

67. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~2,5-dihydroxy-1,4-benzoquinone~~ 2,5-dihydroxy-1,4-benzoquinone.

68. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~4,5-dihydroxy-4-cyclopentene-1,2,3-trione~~ (croconic acid) 4,5-dihydroxy-4-cyclopentene-1,2,3-trione.

69. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~2-hydroxy-2,4,6-cycloheptatrienone~~ (tropelone) 2-hydroxy-2,4,6-cycloheptatrienone.

70. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~5,5-dimethyl-1,3-cyclohexane-dione~~ (dimedone) 5,5-dimethyl-1,3-cyclohexanedione.

71. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is ~~6-hydroxy-1-tetralone~~ 6-hydroxy-1-tetralone.

72. (Currently amended) The apparatus of Claim 60 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ are compound is selected from the group consisting of: ~~3,4-dihydroxy-3-cyclobutene-1,2-dione (squaric acid); 2,5-dihydroxy-1,4-benzoquinone; and 2,5-dihydroxy-1,4-benzoquinone; 4,5-dihydroxy-4-cyclopentene-1,2,3-trione (croconic acid) 4,5-dihydroxy-4-cyclopentene-1,2,3-trione; 2-hydroxy-2,4,6-cycloheptatrienone (tropelone) 2-hydroxy-2,4,6-cycloheptatrienone; 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone (rhodizonic acid) 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone; 2-hydroxy-1,4-naphthoquinone 2-hydroxy-1,4-naphthoquinone; 3-oxo-1-gulofuranolactone 3-oxo-1-gulofuranolactone; 2,2-dimethyl-1,3-dioxane-4,6-dione 2,2-dimethyl-1,3-dioxane-4,6-dione;~~

4-ketobutyrolactam; ~~5,5-dimethyl-1,3-cyclohexane dione~~ 5,5-dimethyl-1,3-cyclohexanedione; ~~tetrahydrofuran-2,4-dione~~ tetrahydrofuran-2,4-dione; ~~6-hydroxy-1-tetralone~~ 6-hydroxy-1-tetralone; ~~2,3-dihydroxy-2-cyclopropene-1-one (deltic acid)~~ 2,3-dihydroxy-2-cyclopropene-1-one; and uric acid.

73. (Currently amended) The apparatus of Claim 60 wherein said vinylogous carboxylic acid ~~compound compounds include positively charged~~ is a cationic enol ester derivatives derivative of said compound a vinylogous carboxylic acid.

74. (Currently amended) The apparatus of Claim 60 wherein said vinylogous carboxylic acid ~~compound compounds include positively charged~~ is a cationic enol amide derivatives derivative of said compound a vinylogous carboxylic acid.

75. (Currently amended) A kit for ~~performing~~ indirectly detecting ions in a sample by capillary electrophoresis, comprising:

~~one or more reagents, wherein the one or more reagents include~~ a background electrolyte solution comprising one or more probes comprised of one or more that is a vinylogous carboxylic acid compounds compound and a buffer.

76. (Canceled)

77. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds is comprised of~~ compound has a structure comprising: one or more enol functional groups in conjugation with one or more carbonyl functional groups through one or more carbon-carbon or ~~carbon-nitrogen~~ carbon-nitrogen double bonds.

78. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is present as a keto-enol tautomers of said compounds tautomer.

79. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinylogous carboxylic acid ~~compounds include~~ compound is an aromatic compounds compound having a stabilized resonance structures structure that are is part of its vinylogous carboxylic acids acid function.

80. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds include~~ compound is a hetero-atom analogues analog of a keto-enol ~~tautomers~~ tautomer.

81. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds include~~ compound is a heteroatom aromatic compounds compound having a stabilized resonance ~~structures~~ structure that ~~are~~ is part of its vinyllogous carboxylic ~~acids~~ acid function.

82. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is 2,3-dihydroxy-3-cyclobutene-1,2-dione (squaric acid) 3,4-dihydroxy-3-cyclobutene-1,2-dione.

83. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is 2,5-dihydroxy-1,4-benzoquinone 2,5-dihydroxy-1,4-benzoquinone.

84. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is 4,5-dihydroxy-4-cyclopentene-1,2,3-trione (croconic acid) 4,5-dihydroxy-4-cyclopentene-1,2,3-trione.

85. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is 2-hydroxy-2,4,6-cycloheptatrienone (tropelone) 2-hydroxy-2,4,6-cycloheptatrienone.

86. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is 5,5-dimethyl-1,3-cyclohexane-dione (dimedone) 5,5-dimethyl-1,3-cyclohexanedione.

87. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds~~ compound is 6-hydroxy-1-tetralone 6-hydroxy-1-tetralone.

88. (Currently amended) The kit of Claim 75 wherein said ~~one or more~~ vinyllogous carboxylic acid ~~compounds are~~ compound is selected from the group consisting of: 3,4-dihydroxy-3-cyclobutane-1,2-dione (squaric acid); 2,5-dihydroxy-1,4-benzoquinone; and 2,5-dihydroxy-1,4-benzoquinone; 4,5-dihydroxy-4-cyclopentene-1,2,3-trione (croconic

acid) 4,5-dihydroxy-4-cyclopentene-1,2,3-trione; ~~2-hydroxy-2,4,6-cycloheptatrienone~~ (tropelone) 2-hydroxy-2,4,6-cycloheptatrienone; ~~5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone~~ (rhodizonic acid) 5,6-dihydroxy-5-cyclohexane-1,2,3,4-tetraone; ~~2-hydroxy-1,4-naphthoquinone~~ 2-hydroxy-1,4-naphthoquinone; ~~3-oxo-1-gulofuranolactone~~ 3-oxo-1-gulofuranolactone; 2,2-dimethyl-1,3-dioxane-4,6-dione 2,2-dimethyl-1,3-dioxane-4,6-dione; 4-ketobutyrolactam; ~~5,5-dimethyl-1,3-cyclohexane-dione~~ 5,5-dimethyl-1,3-cyclohexanedione; ~~tetrahydrofuran-2,4-dione~~ tetrahydrofuran-2,4-dione; ~~6-hydroxy-1-tetralone~~ 6-hydroxy-1-tetralone; 2,3-dihydroxy-2-cyclopropene-1-one (deltic acid) 2,3-dihydroxy-2-cyclopropene-1-one; and uric acid.

89. (Currently amended) The kit of Claim 75 wherein said vinylogous carboxylic acid compound ~~compounds include positively charged~~ is a cationic enol ester derivatives derivative of said compound a vinylogous carboxylic acid.

90. (Currently amended) The kit of Claim 75 wherein said vinylogous carboxylic acid compound ~~compounds include positively charged~~ is a cationic enol amide derivatives derivative of said compound a vinylogous carboxylic acid.

91. (New) The background electrolyte solution of Claims 1 or 20, having a pH in the range of about 7 to 10.

92. (New) The background electrolyte solution of Claims 1 or 20, having a pH in the range of 2–3.

93. (New) The background electrolyte solution of claim 20 wherein the buffer is selected from the group consisting of: a tris base, an amine, and an organic base.

94. (New) The background electrolyte solution of Claims 1 or 20 additionally comprising a dynamic electroosmotic flow modifier.

95. (New) The background electrolyte solution of Claim 94 wherein the dynamic electroosmotic flow modifier is cetyltrimethylammonium bromide or didodecyldimethylammonium bromide.

96. (New) The background electrolyte solution of Claims 1 or 20 additionally comprising an organic solvent.

97. (New) The background electrolyte solution of claim 96 wherein the organic solvent is selected from the group consisting of: methanol, ethanol, and acetone.

98. (New) The method of claim 39 wherein the background electrolyte solution has a pH in the range of about 7 to 10.

99. (New) The method of claim 39 wherein the background electrolyte solution has a pH in the range of 2–3.

100. (New) The method of claim 39 wherein the buffer is selected from the group consisting of: a tris base, an amine, and an organic base.

101. (New) The method of claim 59 wherein the electro-osmotic flow modifier is cetyltrimethylammonium bromide or didodecyldimethylammonium bromide.

102. (New) The method of claim 39 wherein the vinylogous carboxylic acid compound has a concentration of about 2 to 5 mM.

103. (New) The method of claim 39 wherein the background electrolyte solution additionally comprises an organic solvent.

104. (New) The method of claim 96 wherein the organic solvent is selected from the group consisting of: methanol, ethanol, and acetone.

105. (New) The apparatus of claim 60 wherein the vinylogous carboxylic acid compound has a concentration of about 2 to 5 mM.

106. (New) The apparatus of claim 60 wherein the background electrolyte solution has a pH in the range of about 7 to 10.

107. (New) The apparatus of claim 60 wherein the background electrolyte solution has a pH in the range of 2–3.

108. (New) The apparatus of claim 60 wherein the buffer is selected from the group consisting of: a tris base, an amine, and an organic base.

109. (New) The apparatus of claim 60 additionally comprising a dynamic electroosmotic flow modifier.

110. (New) The apparatus of claim 109 wherein the electroosmotic flow modifier is cetyltrimethylammonium bromide or didodecyldimethylammonium bromide.

111. (New) The apparatus of claim 60 wherein the background electrolyte solution additionally comprises an organic solvent.

112. (New) The apparatus of claim 111 wherein the organic solvent is selected from the group consisting of: methanol, ethanol, and acetone.

113. (New) The kit of claim 75 wherein the vinylogous carboxylic acid compound has a concentration of about 2 to 5 mM.

114. (New) The kit of claim 75 wherein the background electrolyte solution has a pH in the range of about 7 to 10.

115. (New) The kit of claim 75 wherein the background electrolyte solution has a pH in the range of 2–3.

116. (New) The kit of claim 75 wherein the buffer is selected from the group consisting of: a tris base, an amine, and an organic base.

117. (New) The kit of claim 75 additionally comprising a dynamic electroosmotic flow modifier.

118. (New) The kit of claim 117 wherein the electroosmotic flow modifier is cetyltrimethylammonium bromide or didodecyldimethylammonium bromide.

119. (New) The kit of claim 75 wherein the background electrolyte additionally comprises an organic solvent.

120. (New) The kit of claim 119 wherein the organic solvent is selected from the group consisting of: methanol, ethanol, and acetone.

121. (New) A method of indirectly detecting ions in a sample using capillary electrophoresis, comprising:

introducing the sample into a capillary with a background electrolyte solution containing one or more probes that is a vinylogous carboxylic acid compound, wherein the vinylogous carboxylic acid compound is not tropolone;

applying an electric field along the capillary to cause the ions in the sample to move and to separate along the capillary to a detection region, and
detecting the ions indirectly by ultraviolet photometric detection.

122. (New) The method of claim 121, wherein said vinylogous carboxylic acid compound has a concentration of about 2 to 5 mM.

123. (New) A capillary electrophoresis apparatus for indirectly detecting ions in a sample, comprising:

a capillary having a background electrolyte solution containing one or more probes that is a vinylogous carboxylic acid compound, wherein the vinylogous carboxylic acid compound is not tropolone;

an electrical source which applies an electric field along the capillary to cause the ions to move and to separate along the capillary to a detection region, and

a detector which detects the ions by indirect ultraviolet photometric detection.

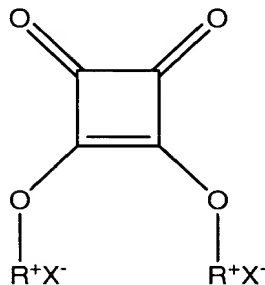
124. (New) The apparatus of claim 123, wherein said vinylogous carboxylic acid compound has a concentration of about 2 to 5 mM.

125. (New) A kit for indirectly detecting ions in a sample by capillary electrophoresis, comprising:

a background electrolyte solution containing one or more probes that is a vinylogous carboxylic acid compound, wherein the vinylogous carboxylic acid compound is not tropolone.

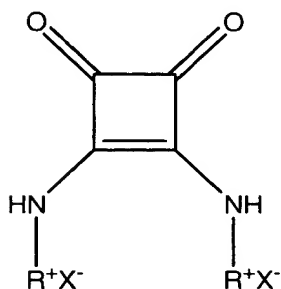
126. (New) The kit of claim 125, wherein said vinylogous carboxylic acid compound has a concentration of about 2 to 5 mM.

127. (New) The solution of claim 17 wherein the ester derivative has the structure:



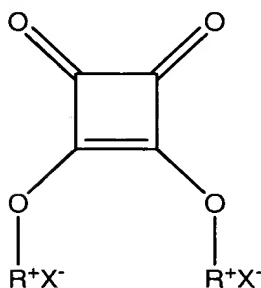
wherein X^- is an ionizable counter ion, and R^+ is an organic cation group.

128. (New) The solution of claim 18 wherein the amide derivative has the structure:



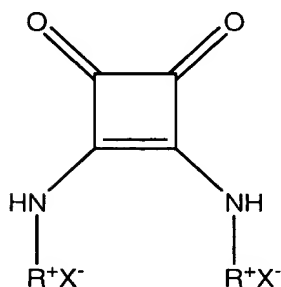
wherein X^- is an ionizable counter ion, and R^+ is an organic cation group.

129. (New) The method of claim 52 wherein the ester derivative has the structure:



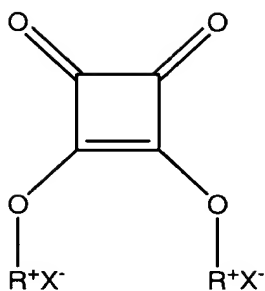
wherein X^- is an ionizable counter ion, and R^+ is an organic cation group.

130. (New) The method of claim 53 wherein the amide derivative has the structure:



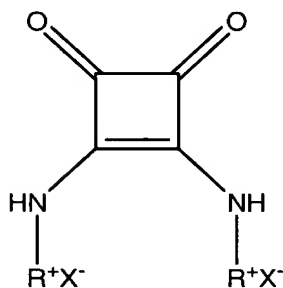
wherein X^- is an ionizable counter ion, and R^+ is an organic cation group.

131. (New) The apparatus of claim 73 wherein the ester derivative has the structure:



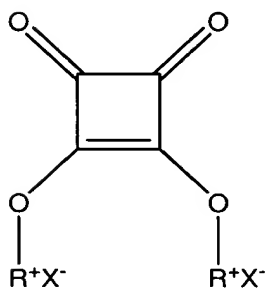
wherein X^- is an ionizable counter ion, and R^+ is an organic cation group.

132. (New) The apparatus of claim 74 wherein the amide derivative has the structure:



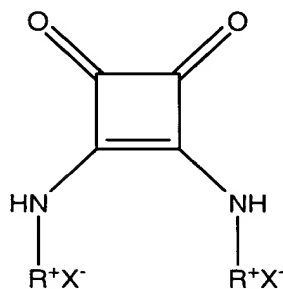
wherein X^- is an ionizable counter ion, and R^+ is an organic cation group.

133. (New) The kit of claim 89 wherein the ester derivative has the structure:



wherein X^- is an ionizable counter ion, and R^+ is an organic cation group.

134. (New) The kit of claim 90 wherein the amide derivative has the structure:



wherein X^- is an ionizable counter ion, and R^+ is an organic cation group.